APPENDIX D.

Description of Forests and Working Circles, Mirpur Range.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
Mirpur.	Gondak.	6,944·28.	Bounded on the north by part kacha Gondak Kosh and part Bahawalpur territory; on the east by part Bahawalpur territory and revenue land of deh Bindi Abdul Satar; on the south by the Fatehpur dhand and part Bahawalpur territory; and on the west by the river Indus, revenue land of deh Abdul Satar and kacha Gondak Kosh.	The northernmost forest in the Mirpur Range on the left bank of the Indus. A detached portion of the forest on the north-east is separated from the main portion by revenue land. The soil is for the greater part a light loamy sand, covering nearly pure sand below. In ordinary inundation about one-third of the area is watered.	The forest is divided into 2 working circles:— Working Circle I—North Lai is the prevailing species, but the greater part of the crop is very indifferent, the only thriving lai to be seen is that on the Baghar dhand and other depressions where it occurs unmixed. Bahan is well represented on the area, except in compartments A^1, B^1 and B^2, in which the crops are very poor. Average density: ·7. Quality: Only the bahan areas are exploitable. Reproduction of coppice is noticeable. Seedlings are rare. Working Circle II—South. Here, too, lai prevails, but that on high alluvium on the west and south is poor and thinning out in places. Bahan is best seen in the compartments on the east; elsewhere, it is indifferent and scattered. About a dozen babul trees stand here and there on the south, and kandi is seen to be establishing itself in the south-east compartments besides being found occasionally in places on the west. Average density: ·6 Quality: The best bahan areas on the east have been felled over; the rest is indifferent. Reproduction: Satisfactory in exploited coupes. Portions of compartments I_1, J_1 and J_2 were overrun by fire in April 1900 which destroyed the young crop, but reproduction by coppice shoots was renewed. In the last two seasons large additions of kacha have been received in front of the forest on the south-west by the river changing to the west of its former channel. They are beginning to be covered with seedling lai in the ordinary course of formation of forest.	The fuel produce of this forest is boated down the river to Sukkur. The forest may be re-stocked with kandi by sowing seed with or without the aid of cereal crops as circumstances may necessitate.
	Raoti.	6,445·0	Bounded on the north by Fatehpur dhand and part of Bahawalpur territory; on the east partly by Bahawalpur territory and partly by revenue lands of deh Wasti and by Wasti forest; on the south by revenue lands of dehs Madan Walo and Raoti; and on the west by part of Bahawalpur territory.	Situated to the south of Gondak forest. The soil varies from a good deep clayey alluvium to a light sandy deposit. Two Public Works Department canals called the Muharo and the Masu take off from the Fatehpur dhand and pass through the forest. Beyond percolation the canals do not assist in the irrigation of the area. About 500 acres are yearly flooded by the Fatehpur dhand on the west of the Muharo and some other low-lying parts are irrigated by three	This forest was an old shikargah of the Mirs. For the purposes of the working plans, the forest has been divided into two working circles:— Working Circle I—East. The Muharo wah (canal) forms the boundary between the two working circles This part contains kandi, lai and bahan often mixed but sometimes unmixed. A few babul are scattered about on the north-west and south. Mature kandi is not plentiful, and the best crops are to be seen in the north of compartments A^2 and A^3. Mature lai also is not plentiful, but some good crops are to be found in the southern and north-eastern compartments. Quantities of dead mature bahan are lying about in the forest. Average density: ·6. Quality: Some good kandi, lai and bahan are exploitable, but the whole represents a scanty stock.	The produce of the forest is boated to Sukkur in the inundation season *via* the Fatehpur dhand and the river. A better distribution of the water flow is necessary. The Muharo and Masu wahs might be brought into use by means of sluices opened in the spoil banks. The Gavi dhoro is a useful source of water supply if the Bahawalpur people could be prevailed upon not to band it.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
				karias cut separately from the dhand. A fourth karia irrigates some part between the two canals The Gavi dhoro from the Bahawalpur State enters the forest on the east and irrigates, though rarely, part of the south-east area. This dhoro is banded in the State but in the high floods the band gives way. The north-east receives water from the Fatehpur dhand through the Bahawalpur State.	Reproduction : Natural regeneration is good in coupes. Kandi seedlings are seen in the irrigated parts. WORKING CIRCLE II—WEST. The special feature of this working circle is the two dense belts of mature babul ; one belt extending along the bank of the Fatehpur dhand and the other belt in the south from the Muharo wah along the southern boundary into compartment G6. In the interior, the crops are poor and scanty, except on low-lying parts which are watered by the Dasai and another departmental karia cut from the Fatehpur dhand. Bahan is rarely present but immature kandi forms good crops though overcrowded with "sar" grass. This is the result of fires which have been a great scourge to bahan and kandi. Mature kandi and bahan form good mixed crops on the south-west. A kacha covered with immature lai, and handed over to the department in 1899-1900, occupies the south western extremity of the forest. A small tali plantation (20 acres) has been raised on the bank of the Fatehpur dhand. The plants are doing well under irrigation by lift carried on departmentally. Average density : 7. Quality : The standing crops [illegible] very good condition. Fires [illegible] to be checked and the interior compartments to be re-stocked. Reproduction : Natural reproduction of kandi is very promising in many parts ; coppice bahan and lai is also very satisfactory in exploited coupes.	
Mirpur.	Wasti.	2,326-36.	Bounded on the north by revenue land of deh Wasti Jevan Shah ; on the east by revenue land of deh Chuto Daho ; on the south by revenue lands of dehs Dub Lundo and Madan Walo and Raoti forest.	Situated to the east of Raoti forest and contiguous to it Soil, a light sandy loam with sandy covered tracts spread about. The forest can only be irrigated by the overflow of the Fatehpur dhand, commonly called the Shah Wah flood and Gavi-dhoro.	The stock consists of kandi and lai mixed ; the former are pollards from former irregular fellings which have branch coppiced. Since the forest was reserved in 1895, lai is poor and dying out in many places for want of water. In shallow depressions mature lai, not very dense, stands decaying. Some mature bahan is seen in compartments 12 and 13 close to the boundary of Raoti forest. Average density : 6. Quality : Poor ; some of the wood is exploitable, but immature lai has no chance of doing well in the absence of water. Reproduction : Practically *nil* in the exploited coupes. The stools are too feeble to coppice. Kandi seedlings are seen in the few irrigated depressions but not to any sufficient extent.	
	Jhanwar.	2,794-36.	Bounded on the north by the North-Western Railway ; on the east by revenue lands of dehs Choran Walo and Goi ; on the south by dehs Bago Daro and Sanko ; and on the south by dehs Jhanwar and Garhelo. A small detached piece lies to the east of the main forest.	Situated on the line of Railway about 3 miles from Khairpur. Soil, poor ; acid "kalar" appears as a white efflorescence over two-thirds of the area and the remaining third is rarely watered.	Its present condition is that of an unproductive "kalar" waste, covered with khabar, kirar and lai, the last reduced to mere scrub. Kandi and asri stand in parts of the south, where irrigation has been most recent, but even here kandi has died out in places and kalar is rapidly spreading. Average density : 2. Quality : Most part poor and unfit. Reproduction : Some kandi and asri coppice is seen in the south rather widely scattered. Growth is not vigorous. Seedlings are entirely wanting.	The area should be disforested.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
Mirpur.	Reti.	2,145-12.	Bounded on the north by revenue land of deh Haiko; on the east by revenue lands of dehs Vinjrate and Deravro; on the south by revenue lands of dehs Deravro, Chand and Beruta; and on the west by revenue lands of dehs Beruta and Rel.	To the east of the last described forest, and about 5 miles south-west of the railway at Reti station. Soil, poor, arid, sandy and unproductive from kalar.	Kandi is seen on the boundaries and is fairly dense in patches in the parts which have received water. But on two-thirds of the area in deh Belo Beruta the soil is wholly unproductive being covered with kalar and sand dunes. Kirar, khabar and lai are present as scrub except on the sand covered tracts. The southern-most strip of forest contains some good kandi mixed with asri, lai and kirar. Average density: ·3. Quality: Most part poor and unfit. Reproduction: The coupes worked from 1896 to 1899 show very little progress made, in fact the results of after-growth are far from promising. Seedlings *nil*.	The area should be disforested.
	[illegible]ngu.	1,064-28.	Bounded on the north by revenue land of deh Mari; on the east by revenue land of deh Gango Daho; on the south by revenue land of deh Kotlo Kamul; and on the west by revenue lands of dehs Gango, Daho and Gang.	Situated about 5 miles to the north of the railway at Reti. The soil is poor, "kalar" being seen on the surface everywhere.	The growth consisting of kandi, asri and lai is very poor. In the north, kandi is dying out except on narrow strips following the Khair and Sone wahis, and along the boundaries where percolation from revenue cultivation assists. Sar grass, too, is dead and withering. In the southern half, the growth looks fresher, but it is scattered, individually or in clusters, with open land between. The forest has been worked in the past and the stock now seen is coppice. It has been closed since 1895, but no perceptible improvement is said to have taken place. Average density: As above. Quality: As above. Reproduction: Feeble coppice. Recent seedlings, *nil*.	The area should be disforested.
	Narli.	1,403-32.	Bounded on the north by Dahar wah and revenue land of deh Rind; on the east by revenue lands of dehs Duri and Nasir Dondu; on the south by revenue lands of dehs Nasir Dondu and Narli; and on the west by revenue land of deh Duri.	Situated to the east of the last described forest and about 3 miles to the north of Reti. Soil arid and sandy. Kalar appears on the surface in large patches and the whole interior is covered with sand dunes.	Some good kandi is to be seen in the vicinity of karia Shor and along the boundaries where cultivation is done. In the interior, it is poor and widely scattered, with asri and lai. Dense covering of dry sar results in injury to the crops by fire. Much of the kandi now seen is coppice occurring singly or in clusters widely scattered. Average density: ·4. Quality: Some little portion of the crop is fit for exploitation. Reproduction: The coupes in the south exploited since 1895 are indifferently stocked with kandi and asri coppice; elsewhere, almost *nil*.	The area should be disforested.
	Raherki.	1,714-20.	Bounded on the north by revenue land of deh Muhammadpur; on the east by a public road from Raoti to Raherki and revenue lands of dehs Muhammadpur and Dhand Raherki; on the south by revenue land of deh Rano Rahur; and on the west by a public road from Mirpur to Raoti and revenue land of deh Kinjhar.	An isolated patch of land about 6 miles to the north-east of Khairpur. Soil, poor; arid "kalar" appears on the surface nearly everywhere.	The stock consisting of mixed kandi and lai is very poor, due partly to bad management and partly to absence of inundation. In most places lai has died out, and in the worst parts as in compartment C2 and round about, even kandi is disappearing. The trees are pollards and stumps which have feebly coppiced and ceased to grow. Kandi on its banks as on the boundaries looks fresher for percolation than that standing in the interior where khabar widely scattered is the only thriving species to be seen. Average density: ·4 Quality: Poor. Very little wood is really exploitable. Reproduction: Recent seedlings, *nil*. The closed coupes in compartments A^4 and A^3 have no chance, under present conditions, of becoming sufficiently re-stocked. Kandi and asri coppice stands scattered with little promise of a future.	It has little chance of improvement, unless the river changes and brings it again under its influence.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
Mirpur.	Islam.	2,076-20.	Bounded on the north by dehs Sayadpur and Dhand Raherki (taluka Ubauro); on the east and south by revenue land of deh Bakro wah; and on the west by revenue lands of dehs Jahan Khan Unar and Islam Lashari.	About 2 miles to the north-east of Mirpur Mathelo station. The soil is sandy. Sand dunes cover the south-western part. Percolation from outside the field cultivation and the Bakro wah assists a little.	The usual two species constitute the growth, much of it being coppice branch and stool shoots from earlier fellings. The best kandi is seen in the north-western compartments. In the north-east southwards the crops are poor and stunted lai having died out in some places. In the south-west compartments kandi is scattered and lai is poorly represented, the area being occupied by sand dunes and the species peculiar to them. "Kalar" appears on the surface everywhere in the south and east, and here only the usual scrub lai is found in separate clusters. Average density :·4. Quality: The standing kandi is exploitable but there is not enough of it. Lai hopeless. Reproduction: The coupes exploited between 1896 and 1899 show a growth of kandi, not very copious. Seedlings are very rare.	The forest will be closed until its condition improves. The latter depends on how soon the forest will again come under the influence of the river.
	Mirpur.	7,067-8.	Bounded on the north partly by Jahanpur forest and partly by revenue lands of dehs Haji Korai and Bago Daho; on the east by revenue lands of dehs Haji Korai, Islam Lashari and Jahan Khan Unar; on the south by revenue lands of dehs Jahan Khan Unar and Mirpur Mathelo; and on the west by revenue lands of dehs Mirpur Mathelo, Khaidero and Wagni.	From one to eight miles north of the Railway at Mirpur Mathelo. The soil of the greater part is poor and sandy and for want of water is arid and unfertile. Low-lying portions are watered by overflow of canals.	For the purpose of working plans, the forest will be conveniently worked in 3 working circles— Working Circle I—North. Wholly a kandi and lai crop, mixed, the former predominating except on low-lying portions on the west where lai is fairly dense. Coppice chiefly from previous exploitation, [illegible] crops being seldom seen. [illegible] abounds and has led to [illegible] damage by fire to the standing crops on both sides of the Multan road. Young growth is seen on the west, and in the immediate neighbourhood of the Muharo and Masu wahs where the surface soil has received irrigation. Average density :·7. Quality: Fair and fit for exploitation. Reproduction: Satisfactory in the closed coupes which have been watered often. Kandi seedlings are numerous in the compartments west of the Muharo wah, but on the east they are not sufficiently represented. Working Circle II—Central. The same two species compose the crops in this, as in the last, working circle, but their condition is poor for want of sufficient irrigation. The principal species are low stunted, and as the south is approached becomes somewhat scattered, and even blanks appear in the extreme south. "Sar" is plentiful in the northern compartments, but gradually disappears lower down. This part being nearer to the railway has come more frequently under the axe, and frequency of fellings combined with want of water has deteriorated the growth. Average density: ·5. Quality: Very indifferent. Reproduction: Coppice in closed coupes is fair, but seedlings are rare, except in the extreme east where the soil receives water from the Masu wah. Working Circle III—South. In this too the same two principal species occur, with a little asri in the compartments on the east. The condition of the crops corresponds with that noticed in the southern portion of the last working circle. A depression on the west is filled with fairly dense lai and kandi on	The Muharo and Masu canals offer the only means of possible irrigation of the forest in the present [illegible] of [illegible] the [illegible] leading [illegible] karias cut [illegible] them after ascertaining levels.

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					its banks looks fresher and more promising than elsewhere, but in the eastern compartments large blanks intervene between scattered clumps of low kandi and lai bush. Average density : ·5. Quality : As above. Reproduction : Coppice is noticeable in the coupes brought under regular fellings since 1895. Broadcast sowing and raising of babul has been attempted in some of the compartments on the north-west, but the plants have failed from frost and want of water.	
Mirpur.	Jahanpur.	4,261-0.	Bounded on the north by a public road from Kotlo Bulo to Bago Daho and revenue lands of dehs Fazul Bhayo and Ding Chacher; on the east by a road from Bago Daho to Mirpur Mathelo and the forest of Mirpur; on the south by revenue lands of dehs Mirpur Mathelo, Isewari, and Tatto Mailino; on the west by a public road from [illegible] to Tando Nizabat and revenue lands of dehs Satabo [illegible] and Fazul Bhayo.	On the north-west of the last described forest. The soil is on the whole a good alluvial clay and being yearly flooded by the river is very fertile. Portions on the south-east above flood level show "kalar" on the surface here and there. The forest receives water directly from the river by floods coming from Tando Nizabat chiefly when the Bukkur reading is 14′ when the latter is 15′-6″ nearly the whole area comes under water.	This is the best forest in the Mirpur range, as regards the production of loco. fuel. For the working plans, the forest is divided into 2 working circles :— Working Circle I—North. Kandi and lai, mixed, constitute the crops. Good mature babul stands in compartments A4 and A5 on the side of the Kotlo Bulo road, and asri is scattered about. Much of the kandi seen on the south is coppice or root-suckers from burnt stumps. Compartments C2, C3, C4, C5, and C6 on the south have been worked, in some cases only partially, and are closed for reproduction. On the west good mature lai occupies a depression, and blanks occasioned by fire are noticeable towards the north. Average density : ·7. Quality : Good, with the exception of deterioration caused by fire. Reproduction : The closed compartments are sufficiently well regenerated by kandi and lai coppice. Seedlings are not as numerous as they might be. High levels on the west of compartment 6 are poor. Working Circle II—South. The same two principal species are seen here, mixed, except in shallow depressions as in the north-west where lai occurs unmixed. On high levels on the east lai is poor and scattered. "Sar" being plentiful, fire has visited nearly every compartment; hundreds of kandi stems are standing dead with root-suckers springing up at their feet. Average density : ·8. Quality : Owing to regular flooding, the crops are dense and are able quickly to recover from the disastrous effects of fire. Reproduction : Satisfactory but for fires. Babul raised by broadcast sowings are not doing well.	Better fire protection is demanded. Fire grazing is largely admitted, and fires are undoubtedly due to this cause. A fire occurring the area burnt should be immediately closed and kept so until regeneration is restored.
	Surhad.	5,288-16.	Bounded on the north by revenue lands of dehs Sarhad, Paro, Khalso, Jahanpur, Tatto, Mailino and Wagni; on the east by the Muharo canal and revenue lands of dehs Khaiduro and Mirpur Mathelo; on the south by the road from Sarhad to Mirpur Mathelo and revenue lands of dehs Faikrato, Motu Maher, Maka and Pano Khalso; and on the west by revenue land of deh Sarhad. The Multan road traverses the forest from south-east to	Close to the line of Railway between Sarhad and Mirpur Mathelo stations. The soil varies but slightly, its usual composition being clay with a small admixture of sand. For irrigation, the forest depends on the river which now has encroached on its north-eastern boundary. Floods descend from the direction of Tando Nizabat and Jahanpur and the whole area comes under water in high floods or when the Bukkur Gauge reading is between 15′ and 16′.	For working plans, it is divided into 3 working circles :— Working Circle I—East. This is the eastern third of the entire area, and is covered with kandi and lai, mature and immature, occurring both mixed and unmixed. The high levels on the south are occupied by nearly unmixed kandi rather scattered and indifferent. In the northern compartments lai predominates, unmixed crops standing in scattered clusters in the beds of dhora depressions. Mixed with kandi it forms dense crops in compartments D9, C9, C8, D8 and E8. In the north of compartment D11 and D10 only mature and immature kandi are seen. Average density : ·6. Quality : Indifferent in the southern half; better elsewhere.	The levels admitting irrigation from the Mubaro canal would improve the condition of the southern compartments, but perhaps there would not be water to spare from the canal.

Range.	Forest.	Area.	Boundaries.	Situation, configuration and soil.	Description of stock.	Remarks.
Mirpur.			north and the Sarhad-Jahanpur road from south-east to north-east.		Reproduction: Established kandi is found on parts which have come under water regularly. High and submerged levels show no reproduction. WORKING CIRCLE II—CENTRAL. This is the middle-third of the forest. Lai is everywhere present, but in the south fairly dense though stunted kandi prevails. Advancing northwards the growth is more open and consists of mature lai in single clusters occupying shallow depressions with scattered kandi on higher ground. Kandi and lai together form dense crops on the northern boundary and between this and the Multan road mature and immature lai occur nearly unmixed. Several plots of revenue land under cultivation are distributed over the area. Average density: ·7. Quality: Fair. Fit for exploitation. Reproduction: In the closed compartments very satisfactory, except on patches of high ground. Babul raised by broadcast sowing has failed everywhere. WORKING CIRCLE III—WEST. The western third of the forest. Dense mixed crops of kandi and lai occupy compartments D^2, E^2, F^2, F^1, E^1 and D^1 and the northern portion of compartment E^4, both m[illegible] immature growth, is foun[illegible] whole is doing well under [illegible]al inundation from the rive[illegible] Elsewhere, compartments C^4, C^3, A^3, A^2, B^2, C^2 and C^1, have been worked as coupes since 1895 and are closed for reproduction. Compartments A^4, B^2 and B^3 contain kandi and lai, but the latter has nearly disappeared, and the former is poor and stunted, the level of the surface being above the reach of overflow. Compartments D^4, E^4 and western part of C^3 are nearly pure lai compartments. Average density: ·7. Quality: Good in the north and rather indifferent towards the south. Reproduction: Many of the closed coupes come under water, and reproduction of lai is good. Kandi seedlings are rare. Bahan seedlings are seen, but these disappear each season under a fresh deposit of silt. Kanh is plentiful on the new lands on the north and "sar" elsewhere.	
	Atal.	1,203·8.	Bounded on the north by revenue lands of dehs Atal Muradani and Motu Maher; on the east by revenue land of deh Motu Maher; on the south by revenue lands of dehs Hamro and Dumano; and on the west by revenue land of deh Atal Muradani.	South of the Railway about a mile from Sarhad. Soil, a sandy loom. The forest is inundated by the floods which come down from Sarhad forest through openings in the railway embankment.	This is for the most part an unmixed lai forest in which the crop is fairly dense and composed of both mature and immature growth of coppice shoots and seedlings. The former is usually found in clusters on raised mounds caused by the deposit of silt and the latter occupy the intervening spaces between. Glades and open pasture lands occur, but these with regular irrigation will soon fill up. Kandi is seen here and there on the boundaries and is freely distributed on the high level on the north-west. Average density: ·8. Quality: Well grown, exploitable. Reproduction: Natural regeneration is very satisfactory. Strenuous efforts have been made to grow babul by sowing seed broadcast, but all to no purpose. Most of the seedlings standing from 2′ to 6′ in height are dead, some are putting forth new shoots to be probably nipped by frost in the next cold weather. Kandi is establishing itself and with a little artificial aid would soon cover the area.	